Residues to Revenues 2009

USA Residential Pellet Stove Sales

Pellet Stove Sales

FY09 1QTR National Average: Retail Price/Ton[1]

<table>
<thead>
<tr>
<th>State</th>
<th>Average Retail $/ton</th>
<th>State</th>
<th>Average Retail $/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>$ 230.00</td>
<td>MN</td>
<td>$ 259.86</td>
</tr>
<tr>
<td>CT</td>
<td>$ 323.17</td>
<td>NH</td>
<td>$ 287.23</td>
</tr>
<tr>
<td>ID</td>
<td>$ 175.00</td>
<td>NJ</td>
<td>$ 304.00</td>
</tr>
<tr>
<td>IN</td>
<td>$ 250.00</td>
<td>NY</td>
<td>$ 274.22</td>
</tr>
<tr>
<td>MA</td>
<td>$ 293.16</td>
<td>OH</td>
<td>$ 275.83</td>
</tr>
<tr>
<td>MD</td>
<td>$ 317.50</td>
<td>PA</td>
<td>$ 299.50</td>
</tr>
<tr>
<td>ME</td>
<td>$ 287.50</td>
<td>WI</td>
<td>$ 267.88</td>
</tr>
<tr>
<td>MI</td>
<td>$ 227.72</td>
<td>VT</td>
<td>$ 264.75</td>
</tr>
</tbody>
</table>

National Retail Average - $289.24/ton (bagged)

*Approximate

Current Wood Pellet Production

Current Pellet Producing Facilities

- Existing Facilities in the United States (2008)
- 110*
### Current Pellet Production

<table>
<thead>
<tr>
<th>State</th>
<th>Count</th>
<th>Production (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI</td>
<td>6</td>
<td>190,000</td>
</tr>
<tr>
<td>MN</td>
<td>3</td>
<td>50,000</td>
</tr>
<tr>
<td>WI</td>
<td>12</td>
<td>220,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>21</strong></td>
<td><strong>460,000 tons</strong></td>
</tr>
</tbody>
</table>

### Potential Pellet Production

- MI 4
- MN 1
- WI 7
- **Total 12**
- **Potential Volume 600,000 tons**

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**Residues to Revenues 2009**

[Logo: Forest Industry Engineering Association]
Pellet Production Numbers

- 2006
  - 483,500 tons available USA

- 2007
  - 547,500 tons available USA
  - 1.5 million tons North America

- 2008 (Estimated)
  - 10 million tons worldwide

- 2012 (Estimated)
  - 20 million tons worldwide*

* Figures from a Piper Jaffray Study unless otherwise noted
  + Wood Resources Quarterly
### Residues to Revenues 2009

<table>
<thead>
<tr>
<th></th>
<th>Crystal Falls, MI</th>
<th>Rotorua, NZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Dec.</td>
<td>-12</td>
<td>8</td>
</tr>
<tr>
<td>Jan.</td>
<td>-16°</td>
<td>7</td>
</tr>
<tr>
<td>Feb.</td>
<td>-14°</td>
<td>7</td>
</tr>
<tr>
<td>Mar.</td>
<td>-8°</td>
<td>9</td>
</tr>
</tbody>
</table>

#### Average Temperatures for Crystal Falls, MI & Rotorua

![Average Temperatures Graph](image-url)
Marketing - Residential Wood Pellets

- Convenience
  - Clean
  - Less Space
  - Easy to Use
- Efficiency
  - More Efficient than Firewood
  - Higher BTU Content than Firewood

Marketing - Residential Wood Pellets (continued)

- Environmental
  - All Natural Fuel
  - Cleaner Burn
Marketing - Commercial Wood Pellet

- Assess Feasibility of Conversion
- Present Fuel Budget can be used to Finance Conversion

Markets – Plant Logistics

- Class A Road
- Rail
- Port
- Avoid handling multiple times if possible
Factors Affecting Products

Markets – Raw Material Sources
- Manufacturing Residue
- Whole Tree Chips
- Biomass Chips
- Roundwood
- Urban/Residential Wood
- Salvaged Wood (Fire, Wind, Etc.)
- Salvaged Wood (Demolition, Pallets, Etc.)
Resource Availability

- Competition for the Resource
  - Traditional Markets (Pulpwood/MDFwood)
  - Biomass Burning Facilities (Potential)
  - Ethanol, Bio-Oil, Etc. (Potential)
  - Animal Bedding (Potential)
  - Landscape Mulch (Potential)
  - Firewood (Potential)

Raw Material Supply

- Consistent Raw Material = Consistent End Product
  - Consistent Input
    - Species Mix
    - Dirt Free
    - Bark Content
    - Moisture Content
  - Dependable Suppliers
  - Know the Raw Material
Raw Material Supply (continued)

- Sustainable Raw Material
  - Ownership of Forest Land
  - Supply Chain (Loggers)
  - Willingness to Commit to Long-Term Contracts

Raw Material Supply (continued)

- Ownership of Harvested Wood (Wisconsin)
  - 70% Logger
  - 15% Mills
  - 15% Forest Growers
Residues to Revenues 2009

Raw Material Supply (continued)

- Sustainable Raw Material
  - Forest Residue
  - Manufacturing Residue
  - Urban/R.O.W. Wood
  - Salvage Wood

Sustainable Finished Product Volumes and Quality

- Production
  - Process
    - Design
    - Equipment
    - Training/Personnel Expertise
  - Safety
    - Fires
  - Weather
    - Cold
    - Rain
Impact of Other Fuels

- Fossil Fuel Price Fluctuation
  - Affects Conversions
  - Affects Transportation of Raw Material and Finished Products

Challenges Continued…
Price History of Heating Oil

*Weekly Wisconsin No. 2 Heating Oil Residential Price*

Source: U.S. Energy Information Administration
Challenges Continued…
Price History of Propane

Weekly Wisconsin Propane Residential Price

Source: U.S. Energy Information Administration

Forest Products Fuel Calculator

- This can be found at:
  - A link to an interactive Excel file is provided within the PDF
Marketing Opportunities

- Industrial Pellets
  - Customers
    - Schools
    - Community Buildings
    - Industry
    - Power Plants
  - Incentives
  - Production
  - Raw Material Used

Wood Pellet Delivery Systems
Marketing Opportunities Continued…

- Residential Pellets
  - Bulk Storage
  - Auto Feed System

OPET Organization for the promotion of Energy Technologies

Residential Storage Units

Photo Credits: http://www.techstore.ie/Renewable-Energy/Wood-Pellet/Wood-Pellet-Storage.htm
http://www.ecostore.ie/acatalog/Wood_Pellet_Store.html
Residues to Revenues 2009

Auto-feed System

National Capacity and Production
Residues to Revenues 2009

WORLD TOTAL WOOD ENERGY/COUNTRY

WHO'S USING WOODY BIOMASS?

European Export Markets

Figures from 2008 SmallWood Conference Presentation: Wood Pellet Association of Canada
Market Opportunities Continued

- Animal Bedding – Applications
  - Home
  - Barn
  - Stables
  - Shelters/Clinics
  - Dairy Farms
  - Poultry Operations
  - Etc.

Market Opportunities Continued...

- Animal Bedding – Specific Uses
  - Horse Bedding
  - Ducks, Geese, and Pheasants
  - Lambing Pens
  - Poultry and Turkey Rearing
  - Litter Boxes
  - Etc.
Market Opportunities Continued…

- District Heating
  - Local opportunity
  - Independent utilities
  - New construction savings
  - Commercial building simplicity
  - Non-explosive fuels

Market Opportunities Continued…

- Process Heat
  - Any system that needs steam or heat
  - Swimming pools, greenhouses, etc.
  - Factories
Export Markets

- Asia
- Europe

Pellet Standard Comparison

- Pellet Fuels Institute Standards (US)
  - PREMIUM: Less than 1% inorganic ash
  - STANDARD: Less than 3% inorganic ash
Identifying Markets

- TradeKey.com
- Internet
- Agency Staff
- Brokers
- Other

Conclusion

- Market Trends
- Market Identification
- Type of Product
- Raw Material
- Know What Will Give You Market Share
  - Price
  - Volume
  - Quality of Product
  - Dependibility
Conclusion

- Flexibility/Adapability

Questions?